

Unit 8 Right Triangles and Trigonometry

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8.1

Find the missing number

3, 6, ____, 12

average between 6 and 12 = Arithmetic mean = 9
How do you find it? why arithmetic?

3, ____, 12, 24

Geometric Mean between 3 and 12 is ____
How do we find it? why geometric?

$$\text{Geometric Mean} = \sqrt{ab} \text{ or } \frac{a}{x} = \frac{x}{b}$$

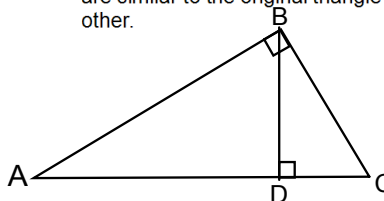
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What is the geometric mean between:

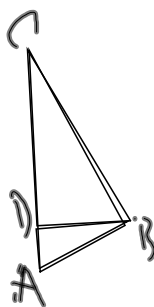
1. 4 and 9
2. 4 and 12
3. 9 and 24

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- The altitude to the hypotenuse of a right triangle divides the triangle into 2 triangles that are similar to the original triangle and to each other.



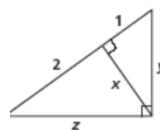
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In a right triangle with the altitude drawn to the hypotenuse, then:

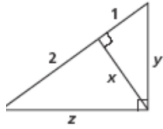
$$\frac{\text{Seg1}}{\text{altitude}} = \frac{\text{altitude}}{\text{Seg2}}$$



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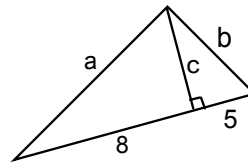
In a right triangle with the altitude drawn to the hypotenuse, then:

$$\frac{\text{whole}}{\text{leg}} = \frac{\text{leg}}{\text{adjseg}}$$



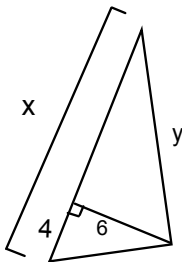
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$$\frac{\text{whole}}{\text{leg}} = \frac{\text{leg}}{\text{adjseg}} \quad \frac{\text{Seg1}}{\text{altitude}} = \frac{\text{altitude}}{\text{Seg2}}$$



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Solve for x and y



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8.2

Pythagorean Theorem

A. In a right triangle, the sum of the squares of the length of the legs is equal to the square of the length of the hypotenuse.

$$\text{leg}^2 + \text{leg}^2 = \text{hypotenuse}^2$$

Pythagorean Triples: set of non-zero whole numbers that satisfy the Pythagorean theorem.

1. 3 – 4 – 5 triangle is the most common

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Converse: If the square of the longest side of a triangle is equal to the sum of the squares of the other two sides, then it is a right triangle.

If c = longest side, a and b = shorter sides

1. $a^2 + b^2 = c^2$ right triangle
2. $a^2 + b^2 < c^2$ obtuse triangle
3. $a^2 + b^2 > c^2$ acute triangle

Ex: Classify each triangle:

1. 7m, 4m, 6m
2. 10 ft, 5 ft, 15 ft

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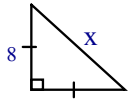
8.2 Draw a square with sides of 6 cm, find the length of the diagonal



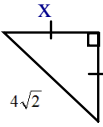
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8.2 Special Right Triangles

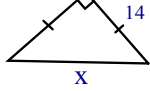
1.



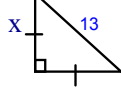
2.



3.



4.

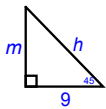


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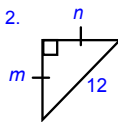
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In a 45-45-90 triangle, the sides have a ratio of $L - L - L\sqrt{2}$

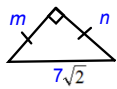
1.



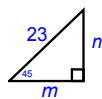
2.



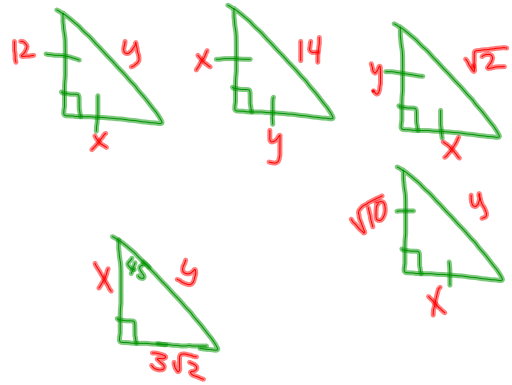
3.



4.



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Nov 30-8:23 AM

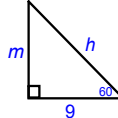
Draw an equilateral triangle with sides of 6,
find the length of the altitude?



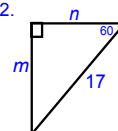
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In a 30 - 60 - 90 triangle, the sides have a ratio of $L - L\sqrt{3} - 2L$

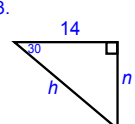
1.



2.



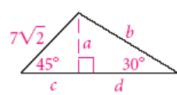
3.



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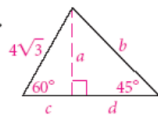
Bellwork

24.



$$\begin{aligned} a &= 7 \\ b &= 14 \\ c &= 7 \\ d &= 7\sqrt{3} \end{aligned}$$

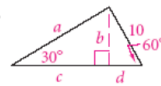
25.



$$\begin{aligned} a &= 6 \\ b &= 6\sqrt{2} \\ c &= 2\sqrt{3} \\ d &= 6 \end{aligned}$$

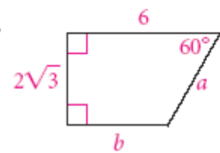
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26.



$$\begin{aligned} a &= 10\sqrt{3} \\ b &= 5\sqrt{3} \\ c &= 15 \\ d &= 5 \end{aligned}$$

27.



$$\begin{aligned} a &= 4 \\ b &= 4 \end{aligned}$$

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